ROCKY FLATS BRANCH COMMENT ON THE DRAFT TECHNICAL MEMORANDUM NUMBER 5
HUMAN HEALTH RISK ASSESSMENT
903 PAD, MOUND, AND EAST TRENCHES AREAS EXPOSURE SCENARIOS
(OPERABLE UNIT NUMBER 2)

GENERAL COMMENT

Throughout the document, exposure pathways and exposure routes are stated to be significant or insignificant. The decision on the significance of most pathways should be made based on the results of the Risk Assessment. Recommend that exposure pathways simply be designated as complete or incomplete in this document.

SPECIFIC COMMENTS

1. Section 1.2, page (p.) 1-2, first paragraph: This paragraph classifies exposure scenarios as significant, insignificant or negligible. However, Section 3.4 classifies scenarios as improbable, plausible or credible. Section 4.5 applies the significant, insignificant or negligible terminology to exposure pathways and routes. Recommend that this type of terminology be dropped altogether or at least that consistent terminology be used to describe exposure scenarios.

2. Section 2.5.3, p. 2-11, second paragraph: If the seeps along the Walnut Creek drainage are currently being remediated, it is unclear why their contribution to surface water contamination would be included in the risk assessment. Please explain further.

3. Section 2.5.4, p. 2-12: The discussion of the use of ground water from the upper hydrostratigraphic unit (UHSU) (or equivalent off-site units) and in the alluvium of the Walnut and Woman Creek drainages needs to be expanded either here or in the landuse sections. There needs to be a specific statement on whether the UHSU is capable of yielding sufficient water for domestic or drinking purposes and whether that water is potable. This statement is needed to support the inclusion or exclusion of an on-site future residential drinking water scenario (Section 4.5.2.6). While there are apparently no wells currently screened in the alluvium of the creek drainages, the possibility of future wells needs to be assessed to support the contention that off-site ground water will not be used in the future for domestic or drinking purposes.

4. Section 4.5, p. 4-5, second paragraph: Recommend that the significant/insignificant terminology be dropped. Please see General Comment.

5. Section 4.5.1, p. 4-6, fourth paragraph: With the possible exception of dilution in ambient air, the arguments in this paragraph for excluding inhalation of volatile organic compounds (VOC) in outdoor air should also apply to indoor air. Recommend that inhalation of indoor VOCs be deleted as a pathway of concern on this basis. If this deletion is not possible, please revise the paragraph to emphasize the dilution argument for outdoor air.

6. Section 4.5.1, p. 4-6, fifth paragraph: This paragraph is inconsistent with the inclusion of ground water ingestion as a complete future on-site exposure pathway (Table 4-1 and Section 4.5.2.6) and with the assumed contribution of ground water to concentrations of indoor VOCs. Please see also Specific Comment Number 3.

7. Section 4.5.2, p. 4-7 to 4-19: This section contains much repetitive material. For example all 6 subsections begin with the same sentence listing potential chemical release mechanisms, and restates in each subsection that ground water and storm runoff contribute to surface water contamination. Suggest that the chemical release mechanism discussions and the general potential pathway discussions be done once at the beginning of Section 4.5 and that the 4.5.2 subsections simply state why particular pathways are included or excluded for a given scenario.

8. Section 4.5.2.1, p. 4-8, second paragraph: The implication that dermal absorption is relatively insignificant with respect to ingestion for soils is incorrect. Risks associated with the two exposure routes for soils are comparable.

9. Section 4.5.2.1, p. 4-8, third paragraph: It is unclear why radionuclides should be excluded from consideration based on expected low concentrations. Radionuclides are the only contaminants for which historical evidence exists for significant wind dispersion. Please explain.

10. Section 4.5.2.1, p. 4-9, first and second paragraph: The arguments against considering plant uptake from soils are not correct. The first bullet limits the discussion to metals when there is no basis for excluding organic compounds. The statement in the next paragraph that intake from ingestion and dermal contact will greatly exceed the intake from plant ingestion is incorrect; for organic compounds intake from plant ingestion usually exceeds intake from soil ingestion or dermal contact by an order of magnitude or more. Recommend that plant uptake from soils be carried through the Risk Assessment.

11. Section 4.5.2.3, p. 4-12, fifth paragraph: The statements in the first sentence concerning the significance of scenarios and exposure routes are incorrect. Direct contact with soils would be expected to be more significant for construction workers, who may be in intimate contact with soils during excavations, than for office workers, and intake via dermal contact and ingestion are comparable. Again, recommend that such statements be dropped.

12. Section 4.5.2.4, p. 4-13, third paragraph: For surface water, exposure via dermal contact is usually much more significant than incidental ingestion, contrary to what is stated here. Given the intermittent nature of the streams and the fact that the ecological researcher would be highly unlikely to be swimming, incidental ingestion would be expected to be negligible in this case. The statements on relative significance should be dropped or corrected. In addition to dermal contact with water, dermal contact with sediments could be an important exposure route. Recommend that this exposure route be added to the Risk Assessment.

13. Section 4.5.2.4, p. 4-13, top of page: Please see Specific Comment Number 5.

14. Section 4.5.2.5, p. 4-15, second paragraph: Given the intermittent nature of the streams and the difficulty of access it would appear highly unlikely that residents would have significant exposure to the creeks. Recommend that this exposure pathway be deleted for the residential scenario. See also Specific Comment Number 12.

15. Section 4.4.2.5, p. 4-15, third paragraph: The fact that there are currently no domestic wells in the alluvium of the Woman Creek and Walnut Creek drainages does not preclude future domestic wells in those locations. Arguments against the future use of ground water off site need to be based on the hydraulic nature of the geological units or the quality of the water. Please see also Specific Comment Number 3.

16. Section 4.4.2.5, p. 4-16, second and third paragraph: Material is repeated verbatim from an earlier section. Please see Specific Comment Number 10.

17. Section 4.4.2.5, p. 4-16, fourth paragraph: Material is repeated verbatim from an earlier section. Please see Specific Comment Number 9.

18. Section 4.4.2.6, p. 4-17, fourth paragraph: Please discuss the evidence that the hydraulic properties of the UHSU are suitable for domestic wells. Please see also Specific Comment Number 3. In addition, if the unit is suitable for drinking water wells, water from the unit would probably also be used for other domestic purposes such as bathing. If ground water ingestion is considered a complete pathway, dermal contact and inhalation of VOCs should be added as complete pathways.

19. Section 4.4.2.6, p. 4-18, second paragraph: For organic compounds intake from plant ingestion usually exceeds intake from soil ingestion or dermal contact by an order of magnitude or more. Please correct the statements to the contrary in this paragraph.

20. Section 5.0, p. 5-2, top of page: The units in the equation are correct only for water or air. Units for soil or plants are usually mg/kg and mg/day for concentration and ingestion rate, respectively. Since all units are given in the tables, this equation could be deleted. Please correct or delete.

21. Section 5.1.5, p. 5-8, first paragraph: Both the ingestion rate and the exposure frequency used for the surface water pathway are generally considered appropriate for swimming. Given the nature of the creeks, it seems unlikely that either an ecological worker or a resident would be immersed in the creeks. Suggest that the ingestion rate be lowered or that the ingestion pathway be deleted altogether since it is unlikely to be important. The exposure frequency is probably reasonable but should be considered a site-specific variable not referenced to Environmental Protection Agency (EPA) 1989a. Please see also Specific Comment Numbers 12 and 14.

22. Section 5.1.7, p. 5-10, first paragraph: The exposure frequency and exposure time are probably reasonable but should be considered site-specific variables not referenced to EPA 1989a since that document assumes a swimmer scenario. Water permeability constants for most organic chemicals are given in Dermal Exposure Assessment: Principles and Applications (EPA 1992) or can be calculated from empirical formulas; there is no need to reference a single default values as is done here. Please see also Specific Comment Numbers 12 and 14.